ESTIMATES AND PROJECTIONS AREA DOCUMENTATION
SUBCOUNTY TOTAL POPULATION ESTIMATES

BACKGROUND

The U.S. Census Bureau produces estimates of total resident population for all areas of general-purpose government on an annual basis. The subcounty areas consist of both incorporated places, such as cities, boroughs, and villages, and minor civil divisions such as towns and townships. We produce subcounty population estimates by a housing unit method that uses housing unit change to distribute county population to subcounty areas. County population estimates are produced with a component of change population method, which updates the latest census population using data on births, deaths, and internal and international migration. A more detailed description of the county methodology can be found here (www.census.gov/popest/topics/methodology/2005_st_co_meth.html). In addition to their use in producing subcounty population estimates, housing unit estimates at the subcounty level are aggregated to the county and state levels and released as a separate data product.

SUBCOUNTY POPULATION ESTIMATES METHODOLOGY

The Census Bureau develops subcounty population estimates using the "Distributive Housing Unit Method" which uses housing unit estimates to distribute the county population to subcounty areas within the county. Housing unit estimates use building permits, mobile home shipments, and estimates of housing unit loss to update housing unit change since the last census. Census counts of housing units are geographically updated each year to reflect legal changes reported in the Boundary and Annexation Survey (BAS), Census corrections, and other administrative revisions.

The Census Bureau develops a household population estimate by applying the occupancy rate and average persons per household (PPH) from the latest census at the subcounty level to an estimate of housing units. The estimate obtained from this method is then controlled to the final county population estimate. The non-household population is measured by the change in the group quarters population. We produce the final estimate by adding the population in group quarters to the household population. The assumption implicit in this method is that changes in the occupancy rate and/or the PPH are measured by the updated county population estimate and that the rate of change in the occupancy rate and/or PPH is uniform within counties.

The estimates are produced using the following steps:

Step 1. Estimating Housing Units

We produce housing unit estimates for each area by the component model described below. The July 1, 2005 estimates are used here as an example.

$$HU_{05} = HU_{00} + (NC_{05} + NM_{05}) - HL_{05}$$

Where:

HU_{05} = Estimated 2005 housing units
HU_{00} = Geographically updated Census 2000 housing units
NC_{05} = Estimated residential construction, April 1, 2000 to July 1, 2005
NM_{05} = Estimated new residential mobile home placements, April 1, 2000 to July 1, 2005
HL_{05} = Estimated residential housing loss, April 1, 2000 to July 1, 2005

Note: We assume that using ¼ of the housing unit input data for the year 2000 represents the three-month period from April 1, 2000 to July 1, 2000.

1A. Census 2000 Housing Units (HU_{00}) -- Census 2000 counts of housing units at the subcounty level reflect BAS updates that are legally effective as of January 1, 2005. The housing unit counts also include Count Question Resolution (CQR) actions, and administrative revisions benchmarked in the TIGER System and the Master Address File (MAF) through May of 2005.

1B. Estimated Residential Construction (NC_{05}) --New residential construction was calculated using the following formula:

$NC_{05} = (BP_{05} * 0.98) + NPC_{05}$
Where:

NC_{05} = Estimate of new residential construction for the period: April 1, 2000 to July 1, 2005
BP_{05} = The residential building permits that result in the construction of new units for the period April 1, 2000 to July 1, 2005 include permits issued in calendar years 2000-2004 (accounting for a six-month lag time between permit issuance and completed construction).
NPC_{05} = Estimate of new residential construction in non-permit issuing areas for the period: April 1, 2000 to July 1, 2005

Note: We assume that using ¼ of the residential construction input data for the year 2000 represents the three-month period from April 1, 2000 to July 1, 2000.

Building permit data are compiled from internal data files developed by Manufacturing and Construction Division (MCD). These files include imputed permits where a jurisdiction did not report permit issuance for the entire year. Housing growth calculated from building permits employs a six-month lag time between the issuance of permits and completion of construction.

Two percent of all building permits never result in the actual construction of a housing unit (as derived from U.S. Census Bureau Current Construction Reports, Series C-20 and Series C-22). Therefore, a factor of 0.98 is used to estimate completed new units.

The annual Survey of Construction (SOC) produces regional estimates of housing units constructed in non-permit issuing jurisdictions. The regional SOC estimates are then distributed to all subcounty areas that have no record of issuing permits for the estimates period. This distribution is based on the subcounty area's share of the regional total of units in nonpermit-issuing jurisdictions as of Census 2000.

1C. Estimated New Mobile Home Placements (NM_{05}) --The Census Bureau does not collect updated data at the subcounty level on mobile home placements. We derive estimates for mobile homes by allocating state mobile home shipment data to subcounty areas based on the subcounty area's share of state mobile homes in Census 2000.

We receive monthly reports on mobile home shipments from MCD. These monthly reports are then summed to calculate the annual total of state mobile home shipments.

To allocate the state mobile home shipment data to subcounty areas, we apply the subcounty area's share of state mobile homes as of Census 2000 to the updated number of mobile home shipments. Because type of structure (the item indicating that a housing unit is a mobile home) was not a 100-percent item in Census 2000, sample data were used to produce the 2005 estimates of mobile homes at the subcounty level. The following steps describe the process of producing sample data that were consistent with the 100-percent housing unit data in current estimates geography.

1. Match each unit in the Sample Edited Detail File (SEDF) to the geographically updated 100% Detail File (HDF) extract, by unit identification number.
2. Apply the updated geographic codes from the HDF (higher level, census tract, and block) to the SEDF records.
3. Re-tabulate the sample data with the sample weights for the primitive geographic areas into which they now are aggregated after the geographic update.
4. Multiply the sample data tallies in each primitive geographic area by the ratio of housing units in the tabulation Census 2000 HDF to the housing units in the tabulation Census 2000 SEDF.
5. Aggregate the results to all estimates universe summary levels.

1D. Estimated Housing Loss (HL_{05}) -- The 2005 estimates of housing unit loss are based on data derived from the 1997-2003 American Housing Survey (AHS) national sample. The following three types of AHS noninterviews were considered to represent permanent loss of a housing unit.

Type B, 16 -- Interior exposed to the elements
Type C, 30 -- Demolished or disaster loss
Type C, 31 -- House or Mobile Home moved

Housing unit loss rates based on these non-interview types were then developed for housing units based on structure type and age of structure. The rates are as follows:

Mobile Homes:	1.58 percent
House, Apartment, or Flat built in:	
1990-1999:	0.031 percent
1980-1989:	0.054 percent
1970-1979:	0.103 percent
1960-1969:	0.172 percent
1950-1959:	0.249 percent
1940-1949:	0.324 percent
Pre-1940:	0.364 percent
Other:	0.019 percent
Overall loss rate:	0.295 percent

The type and age of housing units in Census 2000 for each governmental unit are used to estimate its housing unit loss. Other housing includes a variety of situations not defined above, including boats, recreational vehicles, or other housing arrangements.

Step 2. Producing an Uncontrolled Subcounty Household Population Estimate

The uncontrolled subcounty household population estimate is derived by:

$$UCHHP_{05} = HU_{05} * OCC_{00} * PPH_{00}$$

Where:

$UCHHP_{05}$ = Uncontrolled subcounty household population estimate for 2005
HU_{05} = July 1, 2005 housing unit estimate
OCC_{00} = Census 2000 occupancy rate
PPH_{00} = Census 2000 persons per household

Step 3. Producing a Final Subcounty Population Estimate

The final step in producing a population estimate using the Distributive Housing Unit Method is controlling the uncontrolled subcounty estimates to the published county totals. The following equation describes the calculation of a controlled estimate:

$$SCEST_{05} = [UCHHP_{05}*(CHP_{05}/SUCHHP_{05})] + GQ_{05}$$

Where:

$SCEST_{05}$ = Final 2005 subcounty population estimate
$UCHHP_{05}$ = Uncontrolled 2005 household population estimate
CHP_{05} = Published county 2005 household population estimate
$SUCHHP_{05}$ = County sum of $UCHHP_{05}$ for all subcounty areas
GQ_{05} = 2005 group quarters population estimate

Published County Estimate (CHP_{05}) --The published county population estimate as calculated by the Administrative Records Method for the current estimate year.

County Sum of Uncontrolled Household Population Estimates ($SUCHHP_{05}$)—The county sum of the uncontrolled county population is obtained by summing the estimates for all subcounty areas within a county.

Group Quarters (GQ_{05}) --This component is primarily a combination of military personnel living in barracks, college students living in dormitories and persons residing in institutions. Inmates of correctional facilities and persons in health care facilities and Job Corp centers are also included in this category.

We use group-quarters population data from two sources to estimate subcounty populations: (1) Census 2000 counts of group-quarters population by facility type for each subcounty area, and (2) a time series of individual group-quarters records from the Group Quarters Report (GQR). State representatives of the Federal State Cooperative Program for Population Estimates prepare the GQR.

These two sets of group-quarters population data are used to derive a time series of group-quarters population through the following process:

Part 1. We sum the group-quarters populations from Census 2000 and the GQR to the subcounty level by the seven facility types for each estimate date in the time series.

Part 2. The time series of subcounty group-quarters population by GQ type is then calculated by adding the year-to-year change given by the GQR data to the Census 2000 count of the GQ population.